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A NEW SPECIES OF *MICROMUS* FROM THE WESTERN UNITED STATES (NEUROPTERA: HEMEROBIIDAE)

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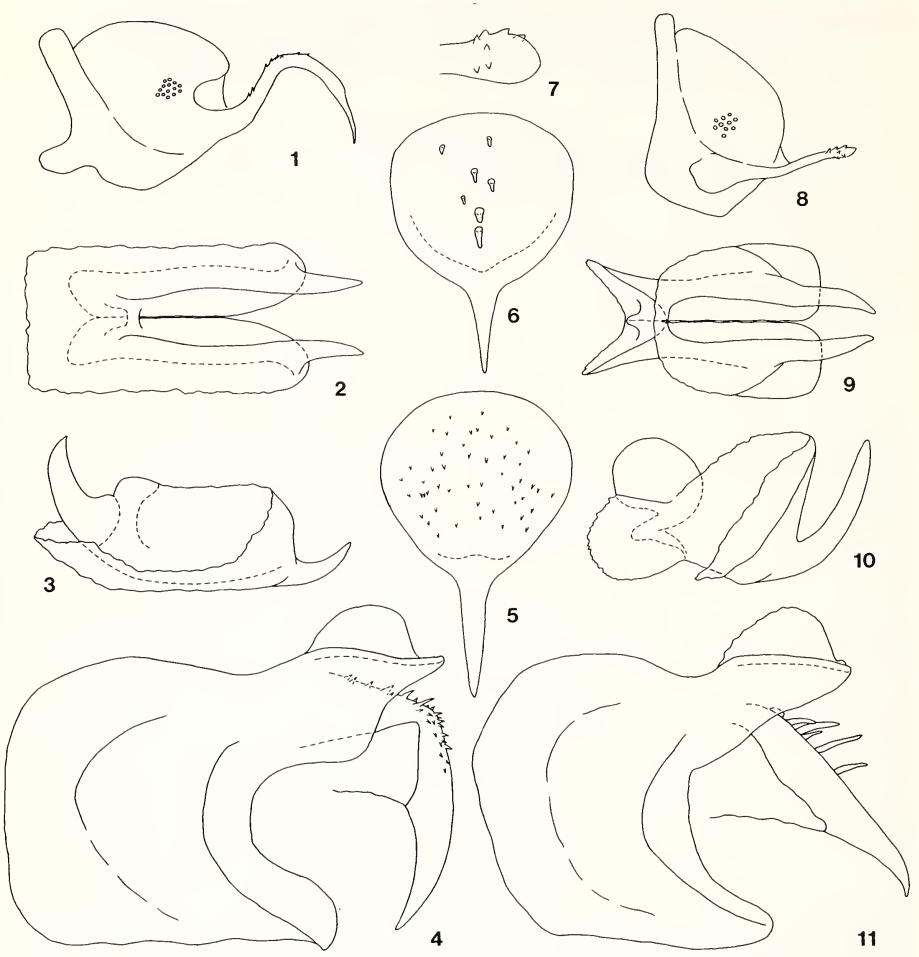
Abstract.—The hemerobiid, *Micromus remiformis* is described as new from western North America. Illustrations of the male genitalic structures of *M. remiformis* and the closely related Nearctic *M. montanus* are presented.

Carpenter (1940) diagnosed and provided a key to the five species of the genus *Micromus* then known from America north of Mexico: *M. angulatus* (Stephens), *M. posticus* (Walker), *M. subanticus* (Walker), *M. variolosus* Hagen and *M. montanus* Hagen. A recent reexamination of North American *Micromus* species has revealed an additional undescribed species closely related to, and previously included in the concept of *M. montanus.*

Since the disparate views of Tjeder (1961), who listed 18 generic synonyms of *Micromus,* and Nakahara (1960), who recognized 11 of these synonyms as valid genera, there has been a trend, primarily by European workers (e.g., Zeleny, 1963; Aspöck et al., 1980), toward recognizing several subgenera within *Micromus* s.l. (e.g., *Nesomicromus, Pseudomicromus, Stenomicromus*). Though it seems useful to identify species groups within *Micromus* in regional faunas as an initial approximation of intrageneric relationships, a cosmopolitan revision of *Micromus* adequately delimiting such groups between regional faunas is presently lacking. Consequently, I believe it is premature to assign subgeneric status to these groups and *M. remiformis*, n. sp. is thus proposed without subgeneric assignment. However, the shape and dorsal spination of the mediuncus, the presence of a dorsal longitudinal keel on the gonarcus bridge and the dorsally lobed condition of the two acute paramere processes strongly suggest a close relationship with the Nearctic *M. montanus* and the European *M. paganus* (Linnaeus), *M. gradatus* Navas and *M. lanosus* (Zeleny).

Micromus remiformis, new species
Figs. 6–11

Description. Size: Forewing length: 8.8–10.7 mm ($\bar{x}$ = 10.0, N = 9); forewing width: 3.5–4.4 mm ($\bar{x}$ = 4.1, N = 9). Coloration: Wing membrane hyaline to pale yellow with light brown mottling. Inner and outer gradate series banded with light brown, veins predominently yellowish. Head, body and legs yellow-brown. Venation: Number of oblique radial branches: 4 (22% of wings examined), 5 (72%), 6 (6%). Number of inner gradate crossveins distal to cubitus: 5 (33%), 6 (61%), 7 (6%). Number of outer gradate crossveins distal to cubitus: 8 (17%), 9 (61%), 10 (22%). MP3+4 fused to Cu1a for a short distance or joined by a short crossvein; first fork of Cu1a beyond its connection with MP3+4 (by fusion or crossvein) closer to that connection than



Figs. 1–11. *M. montanus.* 1. Ninth tergite and ectoproct, lateral. 2. Parameres, ventral. 3. Parameres, lateral. 4. Gonarcus and mediuncus, lateral. 5. Mediuncus, dorsal surface; *M. remiformis,* n. sp. 6. Mediuncus, dorsal surface. 7. Apex of ectoproct process, dorsal. 8. Ninth tergite and ectoproct, lateral. 9. Parameres, ventral. 10. Parameres, lateral. 11. Gonarcus and mediuncus, lateral. Figures shown to same scale: 1 = 8, 2 = 3 = 4 = 5 = 6 = 7 = 9 = 10 = 11.

to wing margin. Male genitalia (Figs. 6–11): Ninth tergite (Fig. 8): slightly broadened anterolaterally but without a distinct anteriorly directed lobe. Ectoproct (Figs. 7, 8): ventral process weakly sinuate, its apex flattened, slightly clubbed and bearing several small teeth. Gonarcus (Fig. 11): bridge with dorsal, longitudinal keel. Mediuncus (Figs. 6, 11): proximal plate broad, its surface usually with fewer than 10, mostly elongate, teeth; apical attenuation short and slender. Parameres (Figs. 9, 10): posterior pair of processes long, strongly reflexed; anterior region of parameres fused into a

compressed plate dorsally and a pair of plates ventrolaterally; ventrolateral plates enclose a median ventral knob. This description is based on 9 males forming the type series. Female genitalia: Subgenitale small, emarginate posteriorly. A pair of large, ventrally convergent, sclerotized plates present dorsal to the subgenitale.

Diagnosis. M. remiformis is indistinguishable from *M. montanus* based on external coloration and venation. *Micromus remiformis* males are readily differentiated from those of *M. montanus* by the weakly sinuate, clubbed ectoproct process which is usually visible without dissection. Males of *M. remiformis* may be further distinguished by the unlobed anterolateral margin of the ninth tergite, the relatively small number and elongate nature of the mediuncus teeth, and the long reflexed processes of the parameres. *Micromus montanus* possesses the following corresponding characters: anterolateral margin of ninth tergite prominently lobed (Fig. 1); mediuncus teeth short and numerous (Figs. 4, 5); apical processes of parameres short and weakly reflexed (Figs. 2, 3).

Females of *M. remiformis* and *M. montanus* are very similar. The sclerotized plates dorsal to the subgenitale in *M. remiformis* also occur in *M. montanus* but are typically smaller and only weakly convergent ventrally. The reliability of this character for species diagnosis needs corroboration, particularly in areas of parapatry where intermediate character states could occur.

Etymology. From the Latin "remus," oar and "forma," shape, in reference to shape of male ectoproct process.

Distribution. M. remiformis is a montane species distributed throughout the western United States, east to northeastern Idaho and central Utah, and south to at least San Bernardino County, California. The distribution of the closely related *M. montanus* is boreal, extending south in the Appalachian and Rocky mountains at higher elevations. Although the distribution of these species in the western Cordillera is not well known, present records suggest that *M. montanus* and *M. remiformis* are allopatric.

Holotype. ♂, in the collection of the California Academy of Sciences. Label data: "CALIF. Madera Co., / Big creek at Boggy / Meadow 4.75 air mi / ESE. of Fish Camp. / Alt. 6400 ft. Aug. / 9, 1971 H. B. Leech," "Holotype / Micromus / remiformis Oswald / J. D. Oswald 1985." Condition: Excellent, genitalia in glycerin-filled microvial pinned below specimen.

Paratypes. 8♂♂ as follows: U.S.A.: **California:** *Mono Co.:* 1 mi W Tom's Place, VIII-13-1957 (UCB), 4 mi E Monitor Pass, VII-15-1966 (author's collection). *Placer Co.:* Ward Cr., 2 mi S Tahoe City, VIII-24-1966 (LACM). *Siskiyou Co.:* Mt. Shasta, McBride Spr., 5,000′, VII-21-1966 (UCB). **Idaho:** *Shoshone Co.:* 2♂♂, Wallace, V-17 & VII-17-1938 (author's collection, UMSP). **Nevada:** *Elko Co.:* Thomas Cyn. Camp, 9 mi SSE Lamoiile [sic = Lamoille], 7,500′, VII-4-1966 (AMNH). *White Pine Co.:* Lehman Cr., 11 km W Baker, 7,500′, VII-25-1981 (author's collection).

Other material. 32♀♀ as follows: U.S.A.: **California:** *Inyo Co.:* Sage Flat Camp, 10 mi W Big Pine, VII-20-1964 (CAS). *Plumas Co.:* 4 mi W Quincy, VI-24-1949 (UCD); 2 ♀♀, Johnsville, IX-27-1963 (UCD). *San Bernardino Co.:* Camp O'Ongo, nr. Running Sprgs., VIII-25-1981, 6,200′ (LACM). *Shasta Co.:* Hat Creek P.O., VII-16-1955 (LACM). *Siskiyou Co.:* 2♀♀, Mt. Shasta, McBride Spr., VII-21-1966 (UCB). *Tuolumne Co.:* 3♀♀, Twain Harte, IX-1/28, 4,000′ (author's collection, UCB, CAS). **Idaho:** *Latah*

Co.: Moscow Mt., [no date] (WSU). *Shoshone Co.:* 17♀♀, Wallace, V-17/VII-29, 3,000′ (author's collection, CMP, UMSP). **Oregon:** *Curry Co.:* Harbor, VI-10-1963, beach at high tidemark (OSU). *Jefferson Co.:* 2 mi SE Suttle Lk., VIII-13-1983 (author's collection). **Utah:** *Utah Co.:* 10 mi E Alpine, VIII-8-1953 (UCD).

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